



# Best Management Practices for Construction and Development Projects

## Hine's Emerald Dragonfly

*Somatochlora hineana*

**Common name** • Hine's emerald dragonfly  
**Scientific name** • *Somatochlora hineana*  
**Federal status** • Endangered  
**State status** • Endangered

### Purpose and Use

The information in this document is to be used to help avoid and minimize species impacts due to construction practices. It is not intended as a guide to manage habitat for a given species. Please contact the Department of Conservation if habitat management information is needed. Because every project and location differ, following the recommendations in this document does not guarantee impacts will not occur to the species and additional information may be required in certain instances. Following the recommendations in this document does not complete Endangered Species Act consultation that may be necessary for species listed under the federal Endangered Species Act; please contact the U.S. Fish and Wildlife Service for more information.

### Ecology

The Hine's emerald dragonfly is an extremely rare dragonfly and the only one on the Federal List of Endangered Species. The largest known breeding population occurs in Door County, Wisconsin. The only other known populations occur at small sites in northern Michigan, northeastern Illinois, and in scattered populations throughout the Missouri Ozarks. The dragonfly has bright emerald-green eyes and a metallic green body, with yellow stripes on its sides. Its body is about 2.5 inches long; its wingspan reaches about 3.3 inches. The Hine's emerald dragonfly lives in calcareous (high in calcium carbonate) spring-fed marshes and sedge meadows overlaying dolomite bedrock. Adult males defend small breeding territories, pursuing and mating with females who enter. The female lays eggs by repeatedly plunging the tip of her body into shallow water. Later in the season or the following spring, immature dragonflies, called nymphs, hatch from the eggs. The nymph lives in the water for 2 to 4 years, eating smaller aquatic insects and shedding its skin many times. The nymph then crawls out of the water and sheds its skin a final time, emerging as a flying adult. The adults may live only 4 to 5 weeks.

Dragonflies play an important role in nature. They catch and eat smaller flying insects, including mosquitoes, biting flies, and gnats.

### Reasons for Decline

The greatest threat to the Hine's emerald dragonfly is habitat destruction. Most of the wetland habitat that this dragonfly depends on for survival has been drained, filled, or ponded to make way for various land use or developments.

Contamination of wetlands by pesticides, excessive nutrients, sediment, or other pollutants also poses a threat. Development that decreases the amount or quality of ground water flowing to the dragonfly's habitat threatens its survival because it depends on soils that remain saturated with shallow groundwater discharge to breed.

### Specific Recommendations

Control nonpoint pollution from urban developments and roadways. Protect water quality by minimizing the use of pesticides (i.e., fertilizers, herbicides, and insecticides), and avoiding application in wetlands. Motor oil, hydraulic fluid, and other chemical spills should be avoided and contained immediately. Minimize impacts to the adjacent uplands, springs, and the native wetland plants within watersheds that contain known Hine's emerald dragonfly sites. Exclude livestock and vehicular traffic from streams, springs, seeps, or mucky wetland areas.

Learn more about the Hine's emerald dragonfly. Understand how the destruction of habitat leads to loss of endangered and threatened species and our nation's plant and animal diversity.

### Beneficial Practices

- Livestock exclusion from fens, seeps, wetlands, sedge meadows, and slow-moving streams or intermittent stream pools.
- Restoration of above habitats with techniques such as restoring hydrology or by controlling invasive species and woody brush invasion.
- Nutrient and pest management on adjacent agricultural fields that results in reduced opportunities for runoff.
- Minimize soil disturbance. Sediment and erosion control are critical on construction sites or other sites with soil disturbance

### Adverse Practices

- Introducing nonnative plant species in or near dragonfly habitats, which are often surrounded by pasture.

- Changing the hydrology of the seep, fen, sedge meadow, slow moving stream, or intermittent stream pools by:
  - Diverting, altering, or collecting the flow through ditching, underground tile or "spring developments."
  - Impounding the habitat or inundating it with a dam or other structure.
  - Dredging or deepening of the habitat to create a pool or pond.
- Altering the landscape surrounding a spring and fen system, which could result in a change in the hydrology or increased sediment delivery.
- Overlooking erosion and ignoring sediment control.
- Removing or degrading the riparian corridor near springs and along streams.
- Application of pesticides, herbicides, insecticides, and inorganic fertilizers that alter aquatic vegetation and/or micro- or macroinvertebrates.
- Operating off-road vehicles or heavy machinery in dragonfly habitats.

## General Recommendations

If your project involves the use of Federal Highway Administration transportation funds, these recommendations may not fulfill all contract requirements. Please contact the Missouri Department of Transportation at 573-526-4778 or the [Missouri Department of Transportation Environmental Studies webpage](#) for additional information on recommendations.

## Information Contacts

For further information regarding regulations for development in rivers and streams, contact:

For species information:

[Missouri Department of Conservation](#)  
 Science Branch  
 P.O. Box 180  
 2901 W. Truman Blvd  
 Jefferson City, MO 65102-0180  
 Telephone: 573-751-4115

For species information and Endangered Species Act Coordination:

[U.S. Fish and Wildlife Service](#)  
 Ecological Services  
 101 Park Deville Drive, Suite A  
 Columbia, MO 65203-0007  
 Telephone: 573-234-2132

For Clean Water Act Coordination:

[Missouri Department of Natural Resources](#)  
 Water Protection Program  
 P.O. Box 176  
 Jefferson City, MO 65102-0176  
 Telephone: 573-751-1300, 800-361-4827

## [U.S. Army Corps of Engineers](#)

Regulatory Branch  
 700 Federal Building  
 Kansas City, MO 64106-2896  
 Telephone: 816-983-3990

## [U.S. Environmental Protection Agency](#)

Water, Wetlands, and Pesticides Division  
 901 North 5th Street  
 Kansas City, KS 66101  
 Telephone: 913-551-7307

## Disclaimer

These Best Management Practices were prepared by the Missouri Department of Conservation with assistance from state and federal agencies, contractors, and others to provide guidance to those who wish to voluntarily act to protect wildlife and habitat. Compliance with these Best Management Practices is not required by the Missouri wildlife and forestry law nor by any regulation of the Missouri Conservation Commission. Federal laws such as the Clean Water Act and the Endangered Species Act, and state or Local laws need to be considered for construction and development projects and require permits and/or consultation with the appropriate agency. Following the recommendations provided in this document will help reduce and avoid project impacts to the species, but impacts may still occur. Please contact the appropriate agency for further coordination and to complete compliance requirements.